

## Botany in North America

In Honor of the XVI International Botanical Congress August 1-7, 1999 • St. Louis, Missouri





Diversity - Habitats and Species: Large migratory herds of caribou are found in the treeless landscapes of northern Canada and Alaska. The animals' existence depends upon the herbs, lichens, and shrubs they eat. The interdependence of plants and animals in an ecosystem means that loss of just one species can threaten many others.



Habitat – Arctic Coastal Plain: Some of the largest petroleum reserves in North America lie beneath one of the continent's most delicate ecosystems. The growing season in the northern latitudes of North America is relatively short, but the region abounds with a diversity of plant life shared with the northern extremes of Europe and Asia. Current patterns of plant distribution are the result of relatively recent climatic changes and warming trends of the past 20,000 years. [DM]



XVI International Botanical Congress: The world's largest gathering of plant scientists was hosted by MBG in collaboration with North American botanical institutions, including the Royal Ontario Museum and Universidad Nacional Autónoma de México. Nearly 5,000 participants from the USA and more than 100 other countries gathered to discuss how plant life affects the stability and sustainability of life on earth. The Congress, which is convened only once every six years, last met in North America in 1969. It serves as a forum for a broad spectrum of scientists whose work on plants ranges from ecology, systematics, biochemistry, and molecular biology, to agriculture, bioprospecting, and medical botany. Above: Yosemite National Park. [GY]

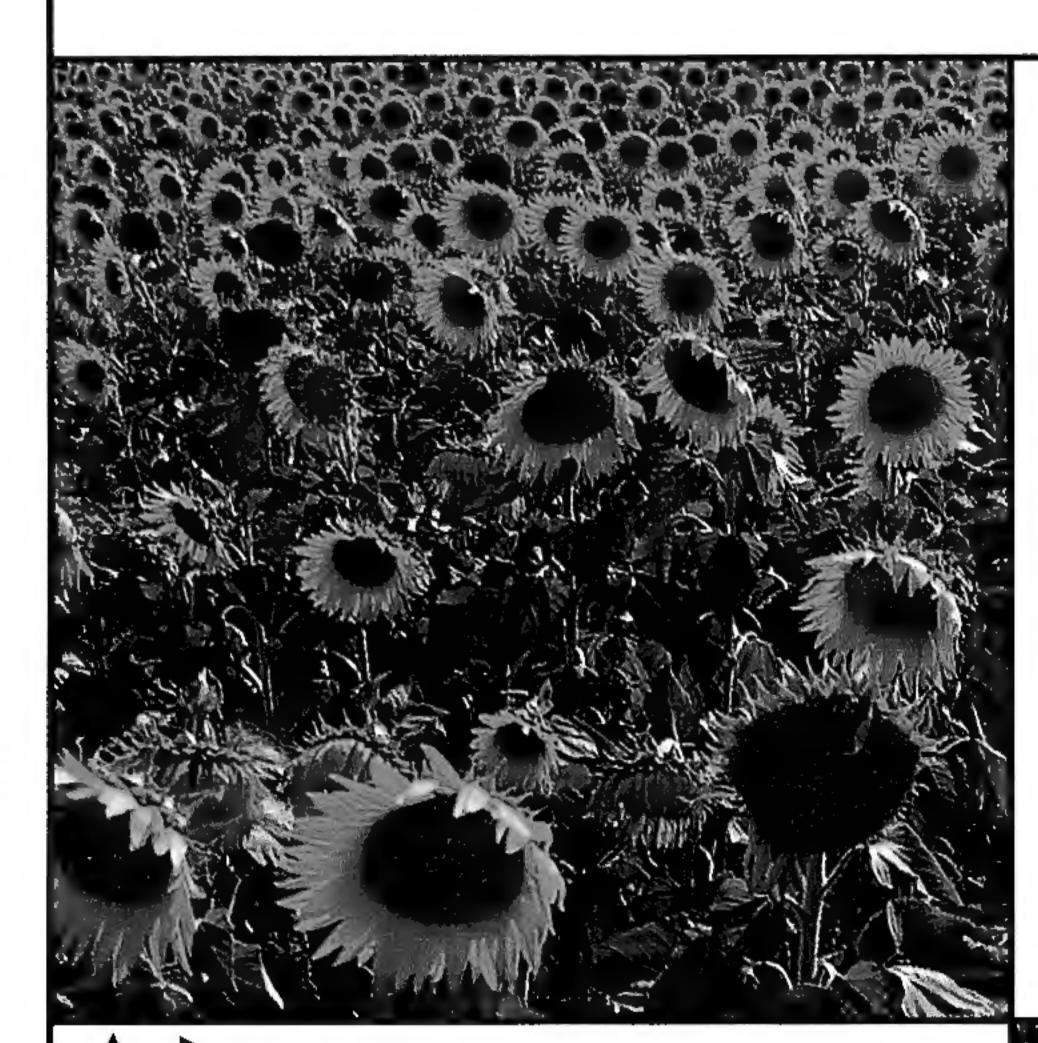
As a leader in gathering and sharing botanical information, MBG actively encourages the exchange of ideas among scientists, business leaders, environmentalists, and conservationists.



Rain Forests – Temperate: The need to protect the biological diversity of tropical rain forests is well known, but the temperate rain forests of the Pacific Northwest in Alaska, Canada, and Washington state are equally threatened. The primary threat to biodiversity worldwide is loss of habitat, driven by a growing human population. Sustainable development provides for human needs without sacrificing future productivity.



Distribution – Arctic: Saxifraga flagellaris (Saxifragaceae), found around the Arctic circle, was first described from the Old World. The plant develops stolons, which produce new plantlets away from the main plant. In these extreme climates, the short growing season puts the flowering period in jeopardy and seed production can be reduced. Species such as this Saxifraga have adapted methods of reproduction that enhance their chances of survival in the harsh Arctic climate. [DM]

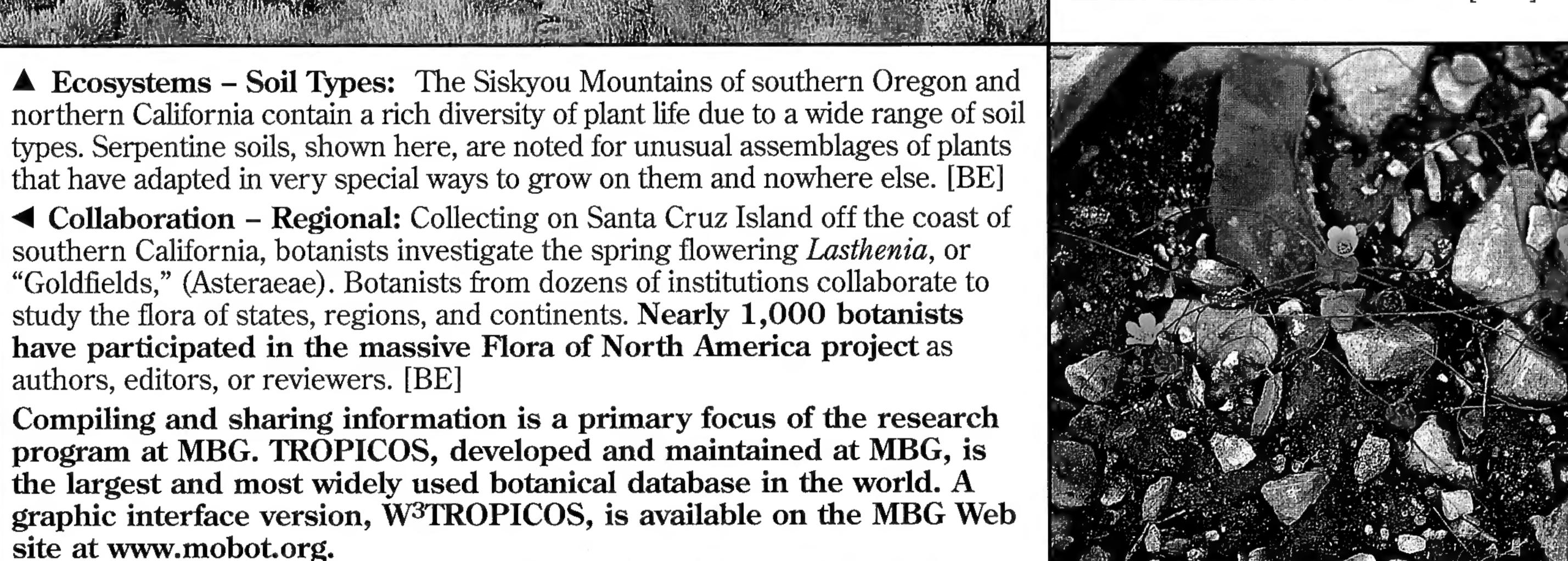


Threatened Species – Endemic: Douglasia beringensis (Primulaceae) is endemic to the Seward Peninsula of Alaska, meaning that it occurs only in that region and is found nowhere else in nature. Endemic species are particularly vulnerable to extinction from habitat loss, as the degradation of even a small area can obliterate entire populations of plants.



northern California contain a rich diversity of plant life due to a wide range of soil types. Serpentine soils, shown here, are noted for unusual assemblages of plants that have adapted in very special ways to grow on them and nowhere else. [BE] ■ Collaboration – Regional: Collecting on Santa Cruz Island off the coast of southern California, botanists investigate the spring flowering Lasthenia, or "Goldfields," (Asteraeae). Botanists from dozens of institutions collaborate to study the flora of states, regions, and continents. Nearly 1,000 botanists have participated in the massive Flora of North America project as authors, editors, or reviewers. [BE] Compiling and sharing information is a primary focus of the research

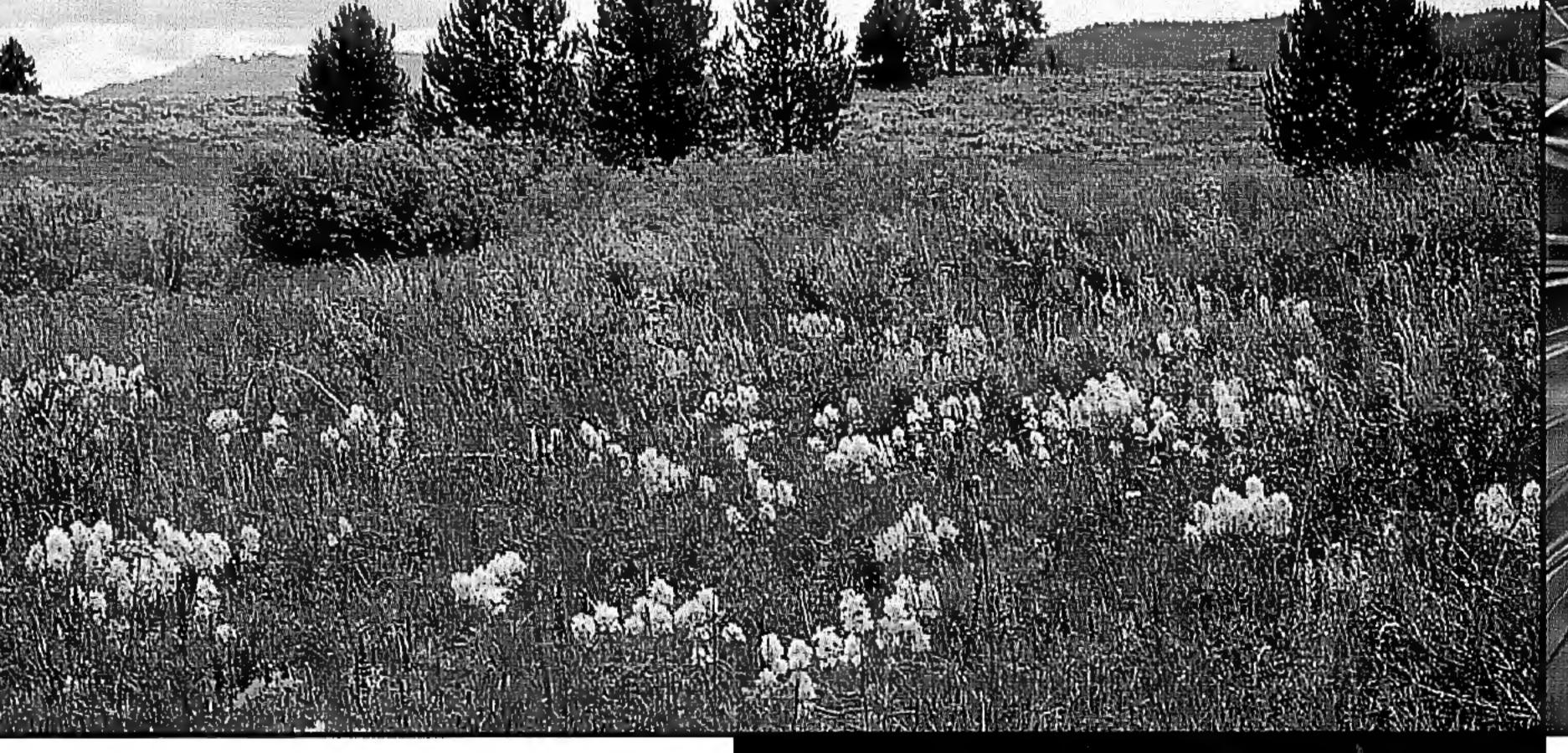
program at MBG. TROPICOS, developed and maintained at MBG, is the largest and most widely used botanical database in the world. A graphic interface version, W3TROPICOS, is available on the MBG Web site at www.mobot.org.



Economic Plants - Native: Sunflowers, Helianthus annuus (Asteraceae), above, are cultivated for their oil and seeds in temperate climates worldwide.[JZ] Sunflowers are the only field crop native to the U.S., compared to about 150 native to Mexico. Corn or maize, Zea mays (Poaceae), right, a member of the grass family, was originally developed from native species in Mexico.[WJ] Three species of grasses, corn, wheat, and rice, are the world's most important food crops.



Habitat – Prairie: Grasslands once covered millions of acres of the North American continent; today only 40% remain, mainly in the western United States. Botanists continue to discover new species every year in North America. Copeland Prairie in central Idaho (right) contains several recently discovered undescribed plant species. Worldwide, species are being lost to habitat destruction before they can be evaluated for their usefulness to humans. [BE]



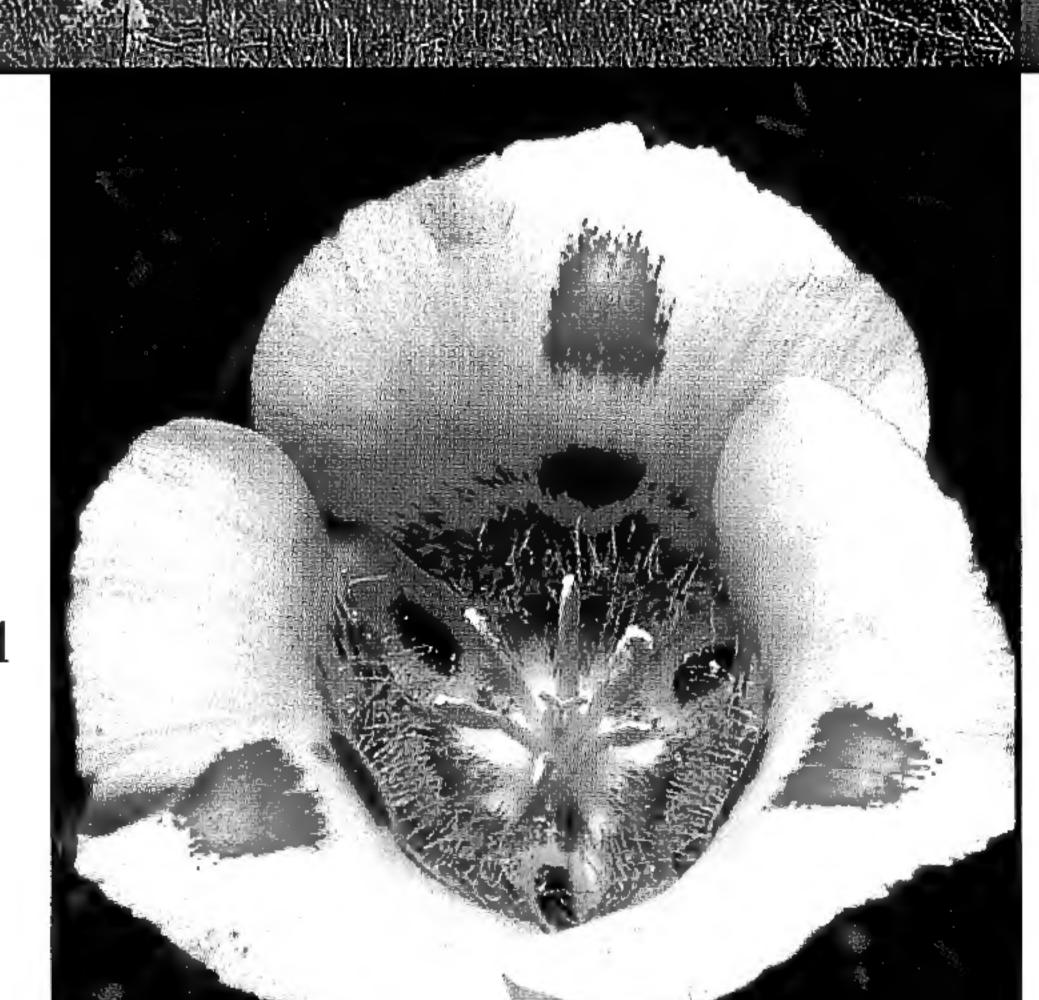
**Economic Plants – Forests:** Coniferous forests are long-term investments, providing renewable sources of lumber, paper, and other products. Harvests occur only after many years of growth. Pine plantations are a valuable source of revenue in the southeastern U.S., where the soils are often poor or sandy and not well-suited for growing other crops. [WJ]



New Discoveries - North America: Mimulus lewisii (Scrophulariaceae) is one of approximately a hundred species of "monkey flowers." In North America the genus is most diverse in the West, with the California Floristic Province containing some 70 species. Three species of monkey flowers are known in Kansas. In the last 20 years nearly 1,200 new species and varieties of plants were described for North America north of Mexico. [AY]



Conservation – Threats: Wild populations of Calochortus venustus (Liliaceae) are threatened by overcollection. With 65 species, the genus has its greatest diversity in California, and many are of special conservation concern. Another species of Calochortus is included in the National Collection of Endangered Plants maintained by the Center for Plant Conservation (CPC). The CPC, headquartered at MBG, works to conserve rare and endangered plants native to the U.S. [PF]



Habitat - Pine Forests: The "longleaf pine," Pinus palustris, (Pinaceae) colonizes areas cleared by fire and is the state tree of North Carolina. Historically this species has been valued in the southeastern U.S as a source of lumber, turpentine, pine oil, tar, and pitch, and more recently as a source of pulpwood.

**Habitat – Riverine Forest:** This

in the Florida Panhandle is an

swamp forest on Eglin Air Force Base



Distribution – Widespread: Darlingtonia californica, (Sarraceniaceae), is a pitcher plant found in *Sphagnum* bogs in the mountains of southwestern Oregon and adjacent California. Eight species of pitcher plants in the genus Sarracenia are known from the southeastern U.S., and the third genus in the family is known from the "Lost World" region of southern Venezuela. [AY]



Diversity – North to South:

plants, is characterized by

megadiversity, as are Brazil,

China, Indonesia, and Australia.

In North America, botanical

diversity increases southward

toward the tropics. Mexico, with

approximately 23,000 species of

Colombia, Peru, Madagascar, India,

Together these countries contain

60-70% of all the world's known

species. At left, Madroño, Arbutus sp.

(Ericaceae), Sierra de Nauchititl.[PT]

nearly a million acres in Mexico. This

mountainous region encompasses the

At right, the Sierra Gorda protects

southern limit of many neo-arctic

species and the northern limit of

many tropical species. Created in

animals. [PT] Below, the unusual

fruits of the monkey nut palm,

Manicaria saccifera (Arecacae),

in the Yucatán Peninsula. [OT]

for many tropical species that

have a wide distribution to the

which grows in freshwater swamps.

Manicaria reaches its northern limit

Mexico is the northernmost limit

1997, the preserve is a refuge for an

extraordinary diversity of plants and

Ecosystem – Wetlands: Taxodium distichum (Cypressaceae), or bald cypress, is the state tree of Louisiana. It is found throughout the southeastern U.S. from Texas to Delaware and north to southern Illinois and southern Missouri. The trees' trunks are enlarged at the base and often are conspicuously buttressed. Wetlands filter and cleanse water and provide refuges for many species of plants and animals. Human pressures are the greatest threat to wetlands. [WJ]

Diversity – Tropics: At least two-

plants in the world occur only in

the tropics, where rapid human

population growth and resulting

pressures on natural resources

member of Fabaceae, the

economically important legume

threaten many plants and animals

with extinction. Calliandra laevis is a

family. It is the second largest family

Asteraceae, the sunflower family. [OT]

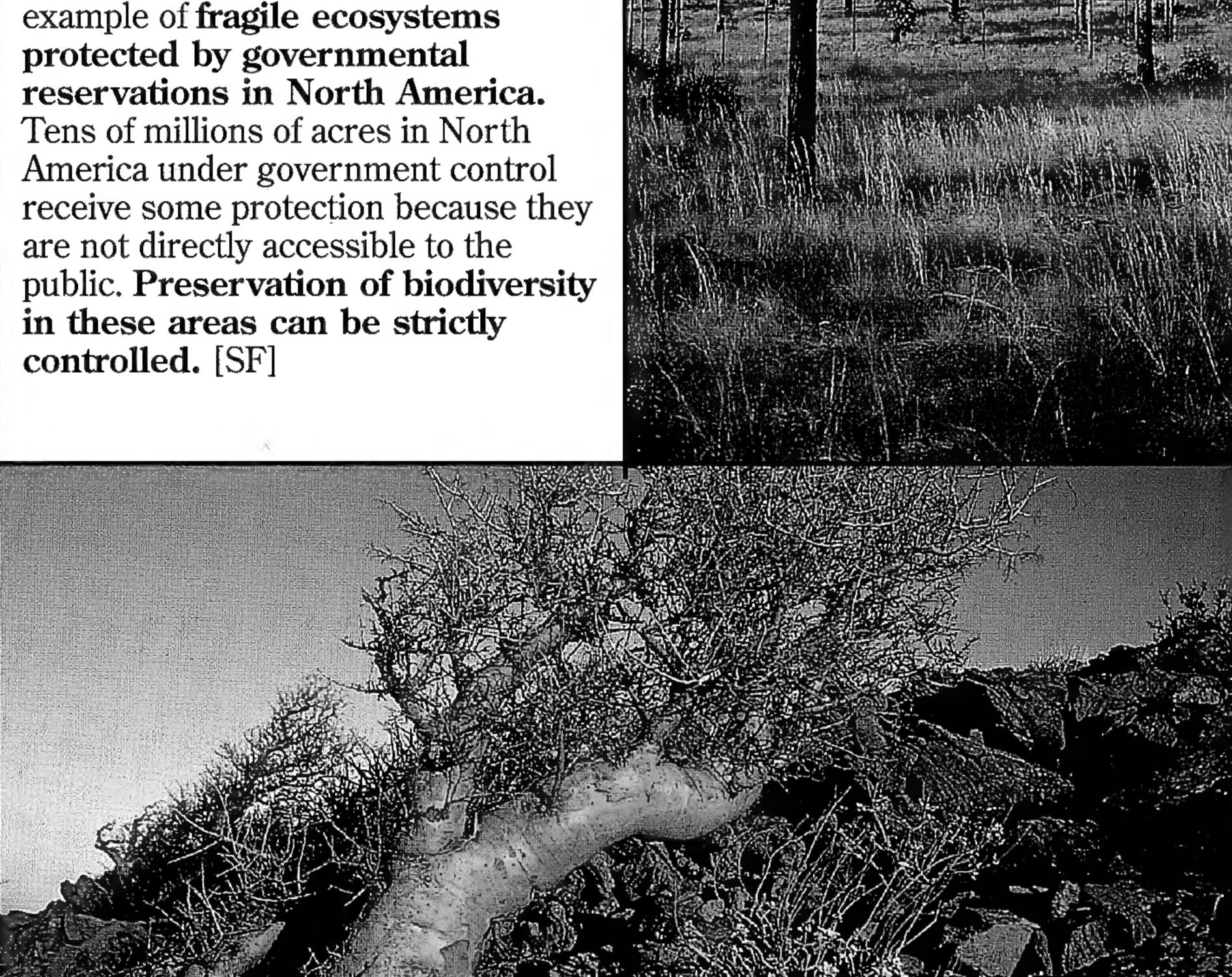
of flowering plants in Mexico, after

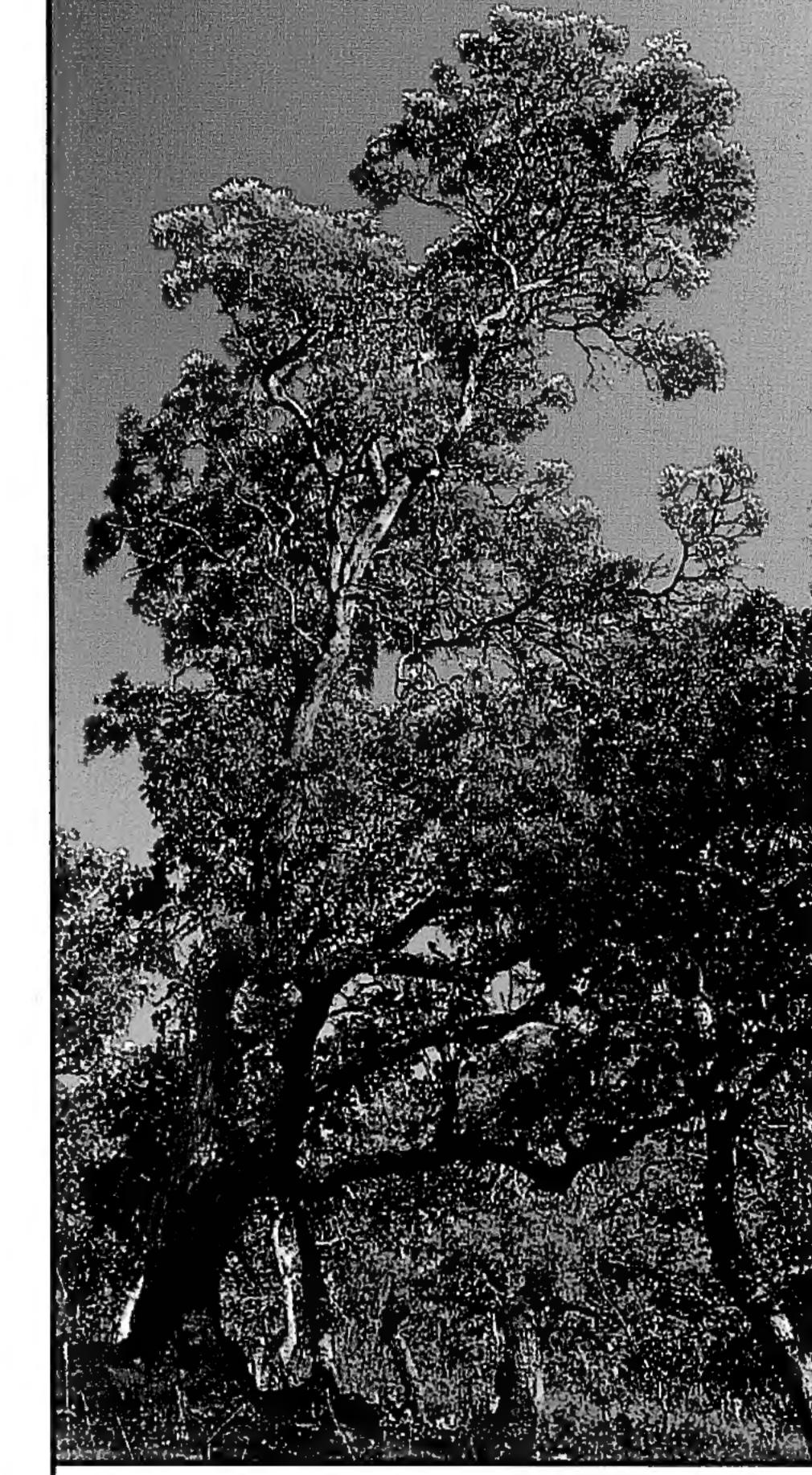
thirds of the approximately

300,000 species of flowering

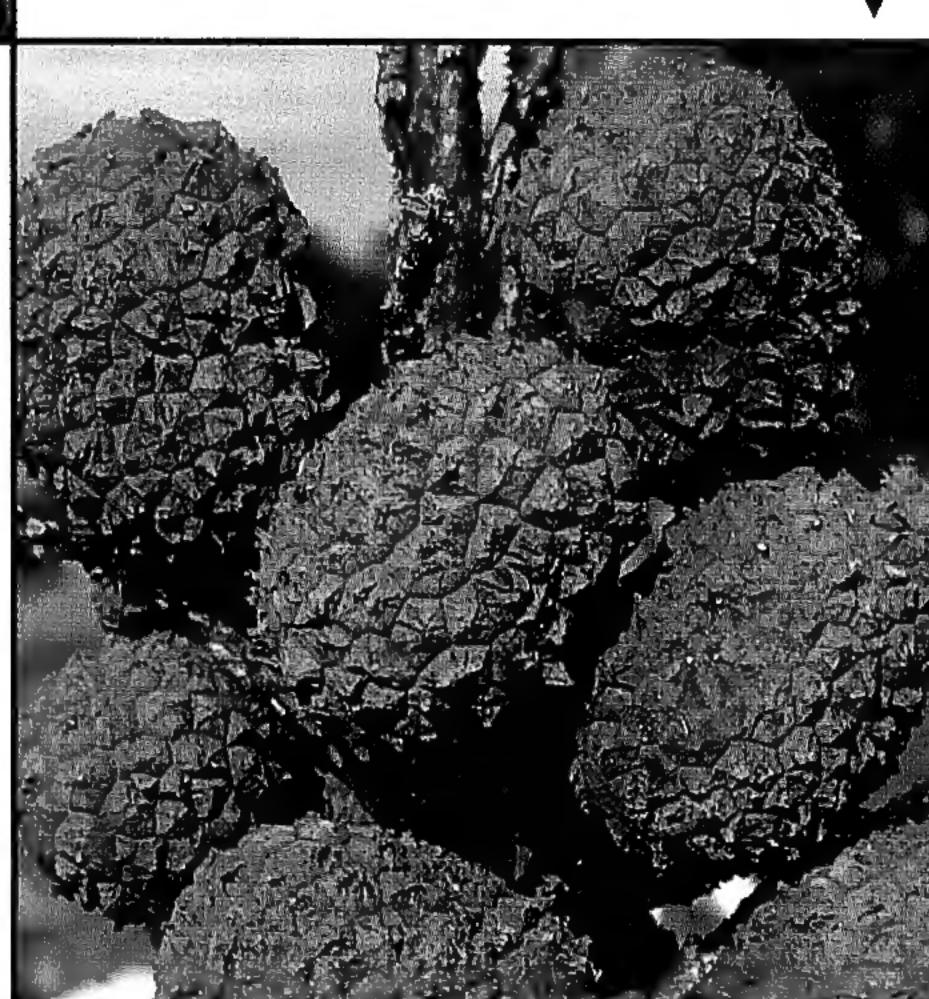


Habitat – Desert: Dry landscapes and deserts of many kinds abound in Mexico. The wide range of climates, topography, and geology through geological time has produced an extraordinary array of biodiversity. Mexico is perhaps the third most biologically diverse country in the world. Shown at left, Cephalocereus columna-trajani (Cactaceae) in the Valle de Tehuacán in south-central Mexico. [PT]

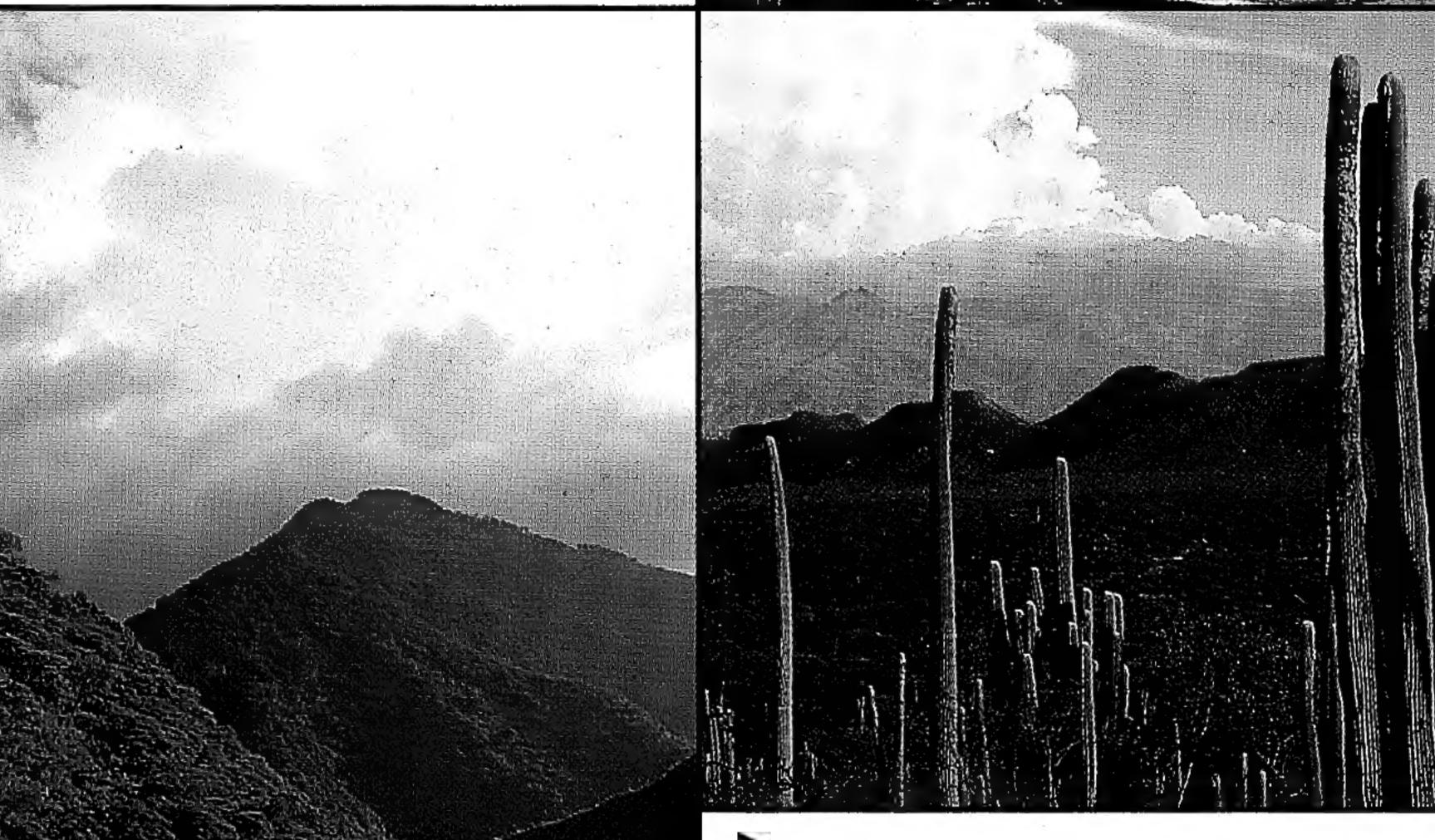




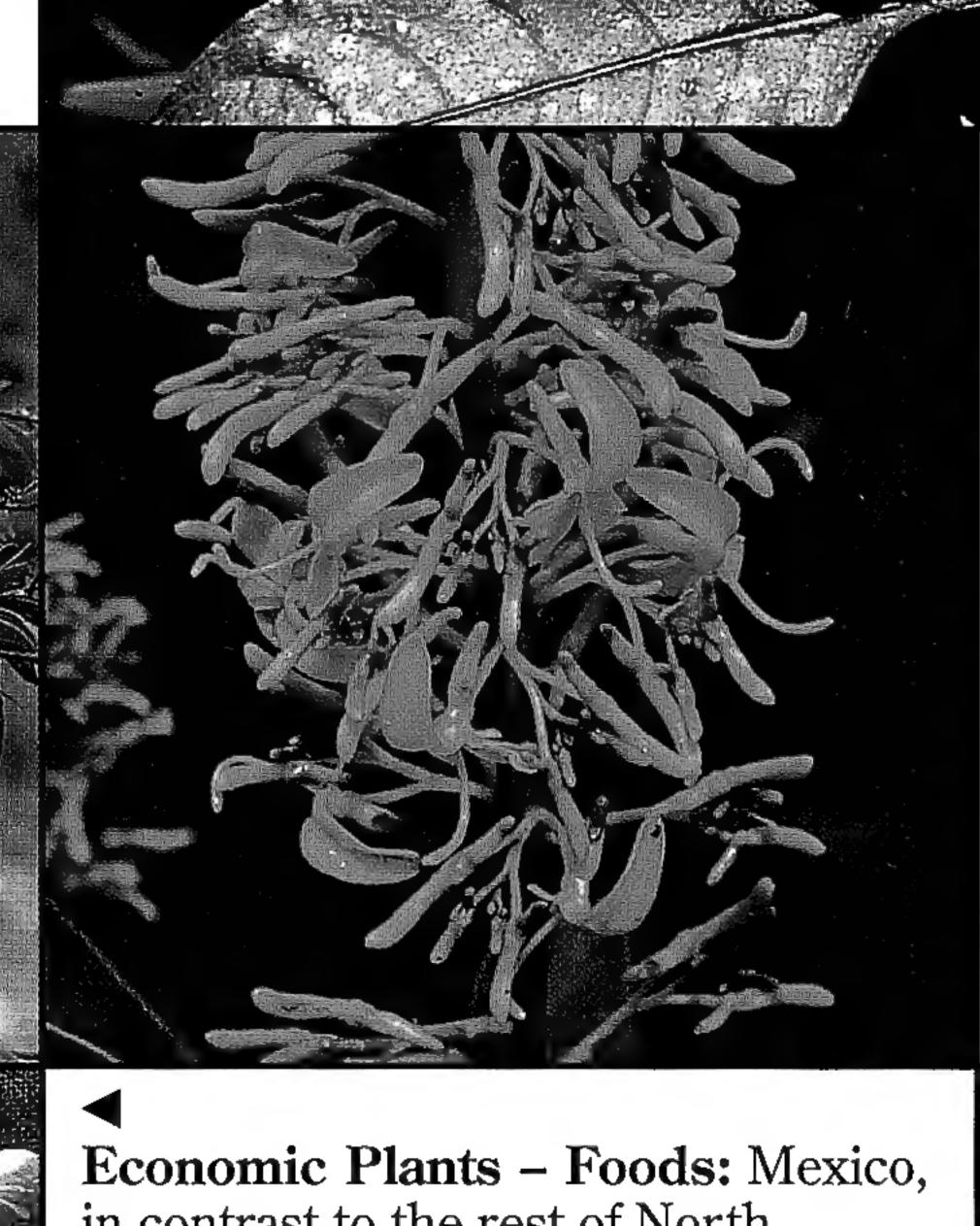
Economic Plants – Weeds/Foods: Prickly pear, *Opuntia* (Cactaceae) is a very large, widespread, and economically important genus. Some species have become naturalized and act as pests in hot, dry regions of the world. Other species, the *nopales*, serve as fodder, and others are highly esteemed for human consumption, both for the pads as vegetables, and the fruits. Cactaceae, the cactus family, is almost exclusively restricted to the New World. Below, Opuntia microdasys. [HH]



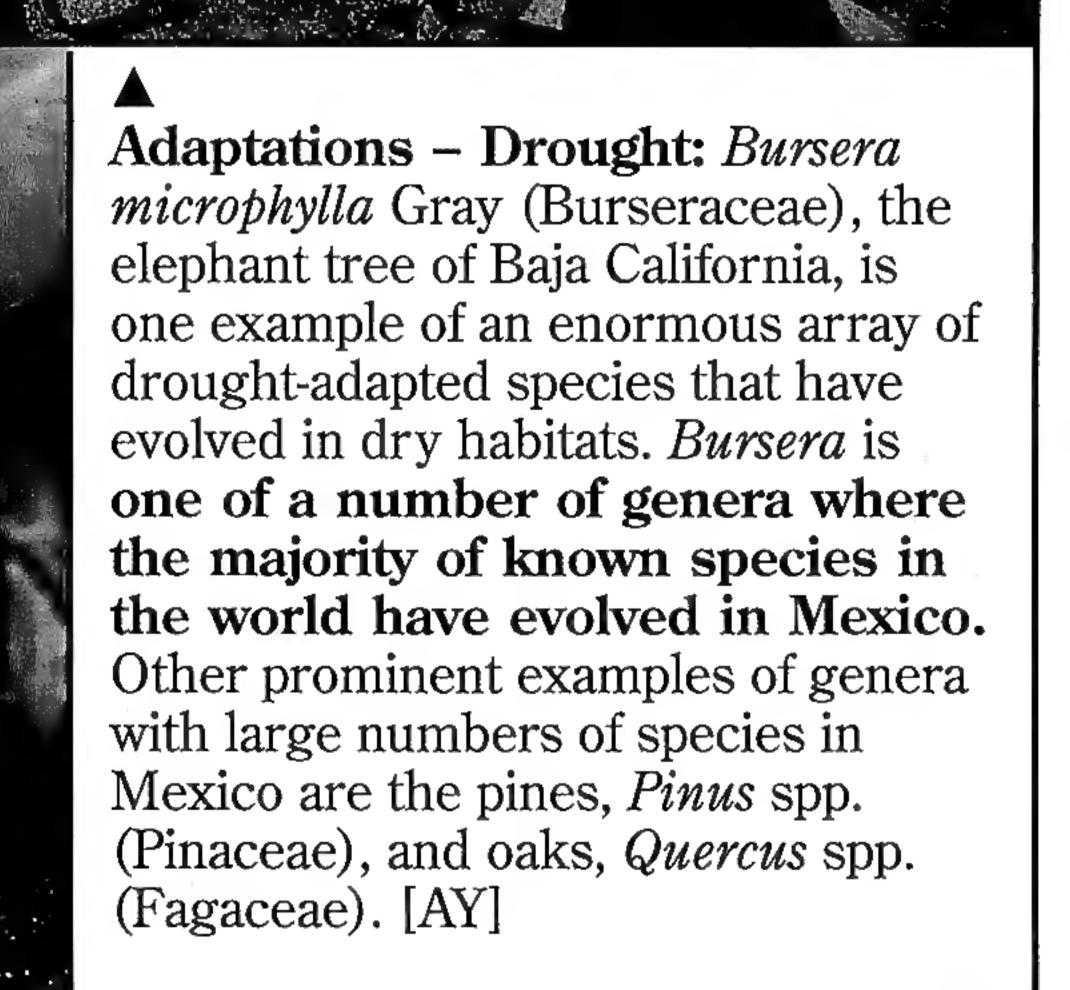
Economic Plants – Cultivation: Sisal, Agave sisalana (Agavaceae), is cultivated for its leaves, which provide fiber for rope and mats. Another species, A. americana, is cultivated for its sap, from which tequila is made. Many native plants have been domesticated in Mexico, and many essentially wild plants are also utilized for various purposes. Cultivated plants often spread far from their place of origin; in the case of sisal, Brazil, Kenya, and Tanzania are the

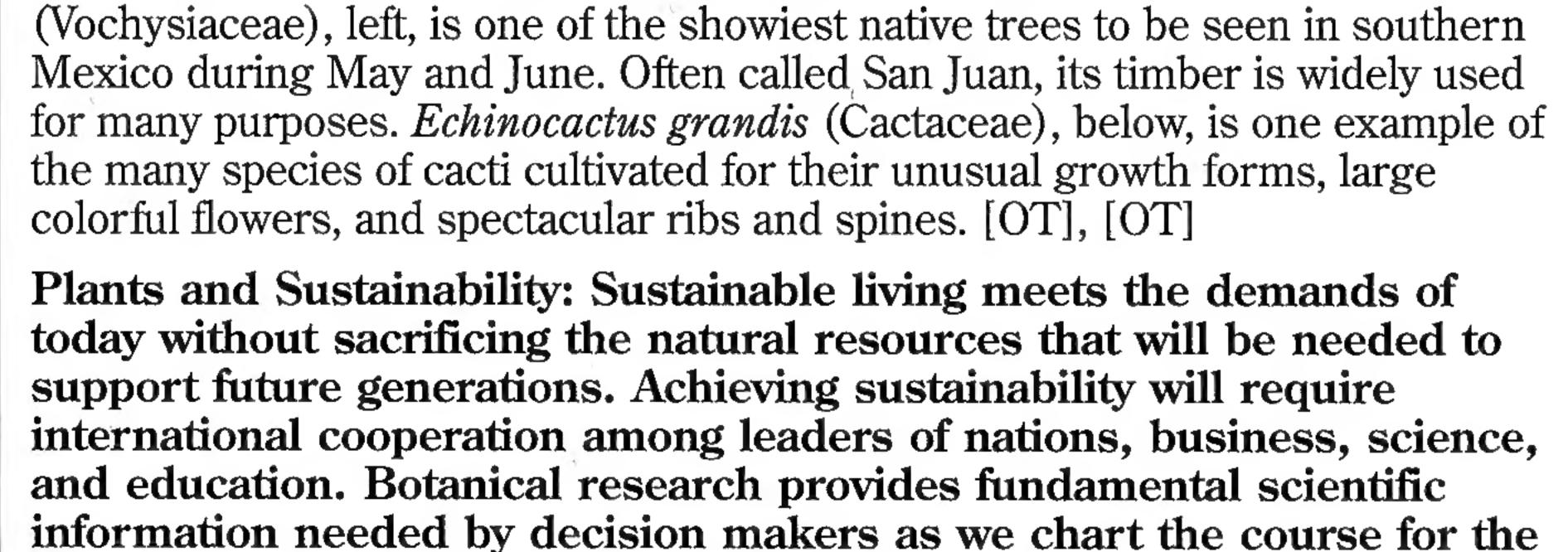


Rain Forests – Tropical: Rain forests and other moist evergreen forests are the predominant vegetation types in southern **Mexico.** These forests are extremely diverse in species that include many epiphytes, herbs (including numerous species of ferns), and shrubs, in addition to the dominating trees and lianas. Right, Aphelandra aurantiaca (Acanthaceae) is a common understory herb or shrub that ranges from Mexico to northern South America. [OT]



in contrast to the rest of North America, is a major source of crops. More than 150 species of cultivated plants have been selected by the prehispanic cultures of Mexico, including maize (corn), beans, chiles, squashes and pumpkins. Many squash and pumpkin cultivars have been selected over time and are valued for their flesh and seeds. Left, Curcurbita pepo (Curcurbitaceae), ready for market. [PT]

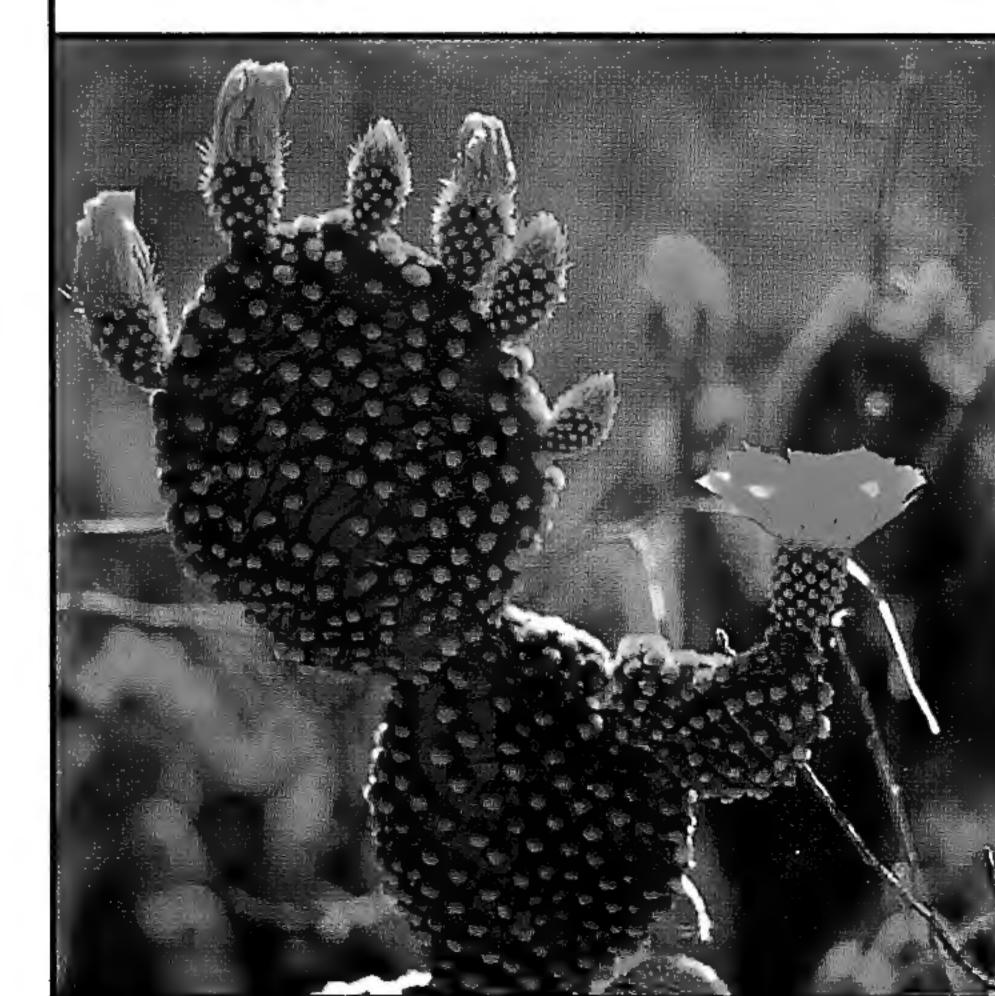




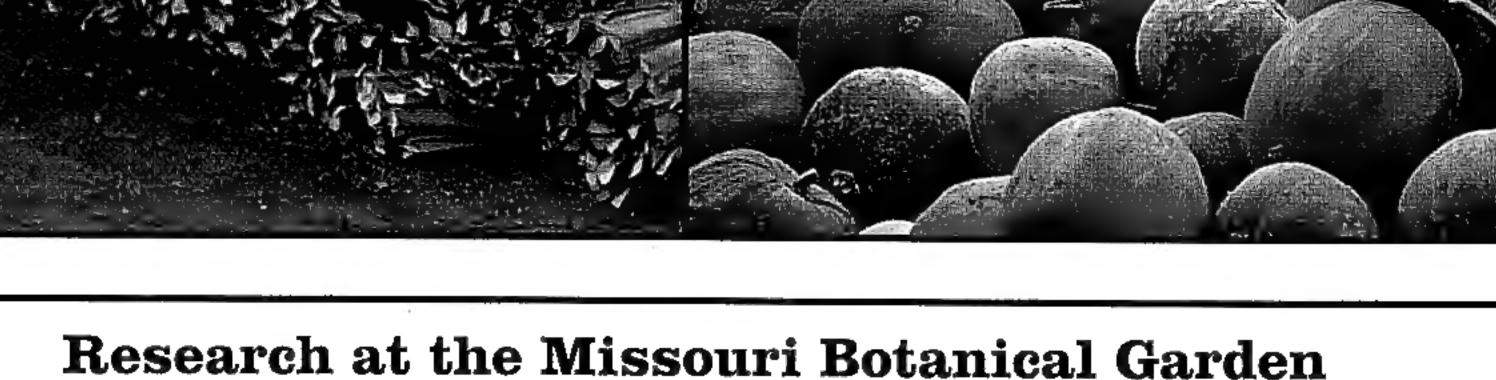
environmental future of our planet. MBG is a world leader in

discovering and sharing information about plants.

Economic Value – Forestry/Horticulture: Vochsia hondurensis



world's leading producers. [GD]



MBG serves as headquarters for the Center for Plant Conservation and for the major collaborative projects Flora of China and Flora Mesoamerica. To help

disseminate botanical information, MBG floristic research and library resources are available on the Garden Web site at http://www.mobot.org.

MBG botanists collaborate with local institutions in each country where they conduct research, providing technical expertise, assisting with fundraising, establishing better communication with the worldwide scientific community, training botanists in the field and at MBG, and helping to build infrastructure.

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Dedication We dedicate this poster to all scientists and instutions participating in the XVI International Botanical Congress,

held in St. Louis August 1-7, 1999.

About 50 Ph.D.-level scientists, many of whom live abroad, assisted by about 80 technical staff and 25 graduate students, form the MBG Research Division. Their studies are concentrated on the plants of Mesoamerica, South America, Subsaharan Africa, Madagascar, China, Vietnam, and North America. Individual MBG scientists are specialists in the plants of particular regions or in the classification of major plant families.

Botanical research provides basic scientific knowledge needed to develop conservation policies to preserve global biodiversity.